THE

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# Gleaner

NATIONAL AGRICULTURAL COLLEGE

## FOOD INDUSTRY ISSUE

# Gleaner

NATIONAL AGRICULTURAL COLLEGE

Farm School, Bucks County, Pennsylvania

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## In this Issue



ON THE COVER: Milk Testing Laboratory at the Lehigh Valley Cooperative Association, Allentown, Pa. *Photo by Byron W. Frazer.*

## Staff




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# . . . . Editorial Comments . . . .

## Thanks—

SINCE the October edition of the GLEANER was planned during the summer months, the editorial staff would like to take this opportunity to thank all freshmen, parents and alumni who gave their support to the GLEANER with their subscriptions.

We believe that with our variety of social and agricultural articles, you will be able to keep in direct contact with the college without actually visiting the campus.

Besides keeping up to date on "Aggie Events," your subscription had helped the GLEANER a great deal. In the near future, we hope the GLEANER will be accepted as a Member of the Agricultural College Magazines Associated. To be admitted into this association would mean a great deal to both the GLEANER and the College.

The main requirements to become a Member of the Agricultural College Magazines Associated are that the magazines have a paid circulation of at least eight hundred subscriptions. With student subscriptions and outside subscriptions, including parents and alumni, the GLEANER'S circulation list includes approximately five hundred. By the end of the first semester, we hope and believe that through the help of the College administration we will have our eight hundred paid subscriptions. Another requirement is that the magazine must be solvent. With eight hundred paid subscriptions we are sure that the GLEANER will have no trouble paying for itself for the first time.

There are many advantages in becoming a Member of the Agricultural College Magazines Associated. One being that much of the work such as advertising is taken off the hands of the editorial staff. All of the magazines of this association receive full page ads from various agricultural concerns such as John Deere, etc. Also, if accepted as a member of this association, we would be able to increase the size of the GLEANER to a thirty-two page magazine. Already this year, the GLEANER has grown from its usual twenty pages to twenty-four.

With your continued support, the GLEANER will continue to be your College literary organ.

## FOOD INDUSTRY – A GROWTH INDUSTRY

SINCE the beginning of man, there has been a need for food. The caveman obtained his food with his hands, the Indian with bow and arrow, the modern housewife with a wire basket in a supermarket.

Food technology, in a country whose claim to world leadership was brought about by advanced technology, has made an everyday occurrence of eating sugar from Cuba, coffee from a few different South American countries, meat from the midwest, fish from the Grand Banks, and countless other kinds and varieties of foods from all over the world. Confidence in the tinned can has grown to such an extent, that many people prefer the stored product to the freshly picked food.

Food packaged in convenient containers, tasted and tested, controlled in quality, and sold at reasonable prices has brought about a drastic change in eating habits during the last half century.

A person growing most of his own food is the remarkable exception rather than the rule today. Problems arose and were solved, not without a great deal of expended time and energy. This time and energy would not have been employed in this manner had there not been a very definite need for the finished product.

Today, with half of the world starving, the need is no less great than it was more than a century ago when Nicolas Appert "canned" his first jar of beans. The population of the world in the next fifty years will more than double. It will be necessary not only to produce more food, and store more food, but to develop new foods.

With the advent of interplanetary travel, nutritious food products capable of growing in space, on almost nothing; food products capable of growing under conditions fantastically different than those found on Earth; perhaps even food products that can feed inhabitants of other worlds will have to be developed. While all of this is conjecture, it is in the realm of possibility. It should be no more unbelievable to us than the thought of keeping a piece of meat without refrigeration for a period of two years was a few years ago. Cold sterilization, a product of the atomic age, is a tiny step in the right direction.

The Food Industry, as old as man himself, with all of its tremendous developments, has hardly begun to develop.

# BIG TIME COLLEGE ATHLETICS

By Pinya Cohen, '57

COLLEGE ATHLETICS is considered by most educators to be a desirable function of an educational program. It stimulates sportsmanship, physical fitness and school spirit. A well rounded athletic department has typified the American college through the years. In recent years, however, the American sports public has become increasingly aware of words such as "de-emphasis." The average sports fan has also been confronted with "the scandal" which was unheard of in college circles years ago, but today has dealt a severe blow to the prestige of many institutions. There apparently is a reason for these recent developments that have manifested themselves in many sports, predominantly basketball.

In many large institutions, college athletics have lost their educational values. Big-time college athletics is now a major part of the entertainment business.

In our society the need for entertainment represents the changing conditions of our lives. It is flexible, highly varied and within the means of virtually the entire population. Furthermore it is a service. It is well advertised by a very aggressive group of people. It is apparent in most educational institutions that the most effective means of entertainment is athletics.

The responsibility for supplying public entertainment is a responsibility different in kind from those services they have previously performed. The failure to understand this fact has led to considerable strain in the management of athletics, bewilderment among educators and the public, and even to notorious scandals. As an educational factor, athletics is intangible and uncontrollable. As public entertainment however, college athletics is in such a form that it may be managed as one would manage a business enterprise.

The basic distinction between athletics and education lies in the institution's own interest in an athlete as distinguished from its interest in other students. In other words, universities and colleges attract students, the purpose of which is to teach them something they do not already know. However, big-time universities, those that emphasize inter-collegiate sports greatly, attract athletes when they are already proficient. The ordinary student is already trained for something that will be useful upon graduation. The activities that the athlete engages in, cease to be useful upon graduation. The purpose of a university is to do what it can for the student, but athletes are recruited for what they can do for the university. Thus, there is a great difference in the operation of the educational and athletic departments of certain schools.

It may be true that big-time athletic programs promote character, spirit and fair play; however, these values

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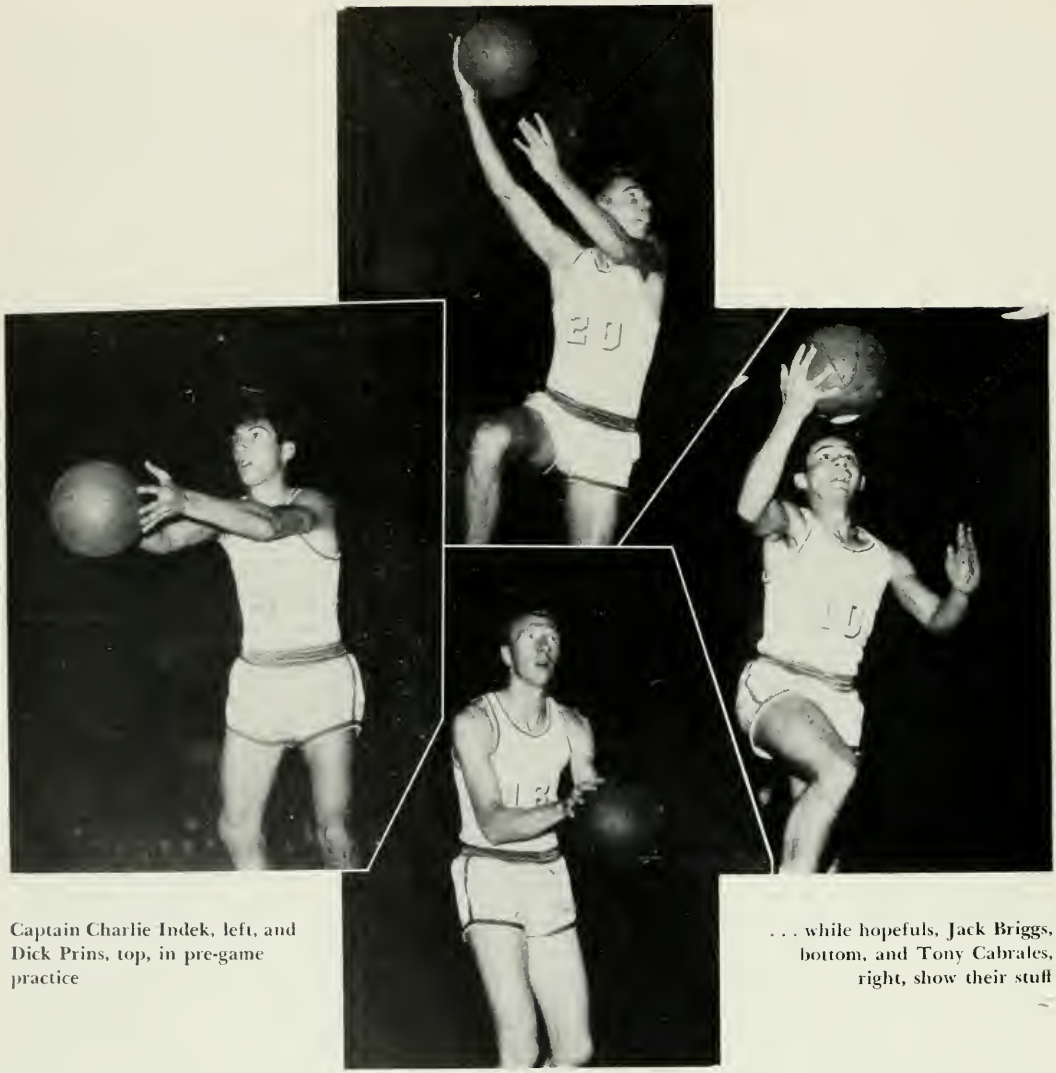
# SPORTSLITES

## BY STAMMEL

WELL IF ANYONE saw the first four ball games this year, they will understand why a proposal was recently made to change the mascot of the college from the Bulldog to the Mudhens. Coach Keys has adjusted his offense to the "Monsoon season" as he installed a "wet" series of plays to go with the yet untried dry series. It was so wet for the Susquehanna game that a requisition went in for four pair of water wings for the backs. Skip Thompson made his longest run in college ball at Kutztown, some 82 yards, only to be called back for a penalty. . .Joe Faline got a kick out of going against some of his old teammates up at Montclair. Joe attended the North Jersey School before coming to N. A. C. His running mate at end, bruising 150 lb. Tom McMinn, had a field day at Brooklyn in throwing their backs for losses. This could be one of the reasons that B. C. dropped football due to "extensive injuries" after they played the Aggies. . . Memo to Jack "Hot Feet" Holtzapfel: The reason that Susquehanna linebacker didn't move after six fakes was that he was stuck in the mud . . . Bill "Slim" McCall joined the team just in time to play before a hometown crowd at Brooklyn. We have two more additions to the "Toothless Grin Club" this year so far. Paul Checkele lost four of his "pearly whites" at Montclair and Skip Thompson lost one at Brooklyn . . . "Bad Bob" Fenyves has taken quite an interest in Penn State this year since he isn't traveling to Lansdale anymore. . . Larry Widdoes is looking forward to playing Susquehanna again next year since one of their players asked him if he was a manager for the Aggies. And after Larry, "The Mighty Mite" caught the pass that beat them last year. . . It seems that the Susquehanna coach made a grave mistake when he asked Coach Keys if they could have the ball if they won the game. That was just too much for the Aggies to take. . . It seems that Coach Guisti had to change his plans when his latest addition came along. He had an application in at N. A. C. for the class of '77 but it had to be changed to the Ambler School of Horticulture under the name of Armanda. . . Has anone noticed how much faster the players run their windsprints this year? The reason could be prizes of milk shakes and bubble gum awarded by Coach Pihos. . . . Sid "Aches and Pains" Blair thinks he will finish the season if the tape holds out. . . The Varsity Club is going to stake Bernie Bunn in a card game so they can increase their treasury. . . Someone finally discovered what Winkie Loesch was allergic to—its football, , , Dick Porter, freshman halfback spends all his practice time recruiting for the "Corps". . .

While the spotlight is still on football, we will soon start thinking of basketball because the "Aggie cagers" are working out already under the watchful eye of Capt. Charlie Indek. . Back at center this year will be Dick Prins who is the highest scorer in the College's history. . . His running mate Bill Haller has turned into quite an after dinner speaker. His first speech centered about the topic—"The Art of Whistle Blowing." That's about it for the present but I'll be looking for you in the next issue.

# COURT COMMENTS



Captain Charlie Indek, left, and Dick Prins, top, in pre-game practice

. . . while hopefuls, Jack Briggs, bottom, and Tony Cabrales, right, show their stuff

AS the colder months come upon us, the young man's fancy turns to basketball. To the average fan, basketball means an exciting forty minutes of vigorous and skillful play of ten members teaming their efforts to put the ball through the hoop.

But to the players it's just the climax to two months of previous practice. Hard, grueling practice which means running, running, and more running.

After the squad is cut to the twelve or fifteen varsity players, formal practice begins. Coach Keys puts the boys through a rough schedule of drills which include passing, dribbling, foul shooting, and other fundamentals necessary to round out the players' techniques. Scrimmage is next. Many intra-squad scrimmages have made and broken prospective starters. After two months of consecutive scrimmages, drills and workouts, the extras are in top condition, physically as well as in technique. With a few outside scrimmages under their belts the first game is approaching rapidly. Now practice has made perfect. Flaws are ironed out and few mistakes are made.

It's here! The first game of the season. The team, on the court, is in the motions of their pre-game warm-up drills; now and only now do the play-

ers see if all of their hard practicing will pay off.

With a slight case of the butterflies the starting five line up for the opening jump.—the ball goes up—. From now on it's up to them, there's no forgetting of plays or loafing. They've got to play for their school, their friends, and most of all, for themselves.

Basketball is a game of teamwork and co-operation, and individuals are soon weeded out. Games come and go, some are victorious while some are sad defeats. They don't mind losing some games for they know it's not only the record book that counts but the love of the game, its memories, the clean, hard competitive spirit both teams show. Win or lose they know they're hard to beat because they are a team.

Last year N. A. C. had that team. Record-wise, the team compiled a 9-7 record, a vast improvement over 1953's 1 and 14 log. Probably the most prevalent factors to this successful season were a couple of guys named Haller and Prins. From the first time they stepped on the N. A. C. court they were unstopable.

Dick Prins, a born record shatterer, has probably broken every record in the N. A. C. record book. Prins, also a born funnyman, kept the fans amazed with his uncanny hooks and tapins. In some instances Richie had opposing fans cheering for him. From the court to the locker room Prins is "a life of the party," happy-go-lucky, sort of Joe, whose love for the game can't be beat. Teaming with Prins, to complete the one-two punch, is Willie Haller. Haller excells in both outside and inside shooting. He can drive for that easy two pointer or equally as well hit with jump shots and one hand push shots from the outside.

After an unfortunate accident in the Bloomfield tussle Captain Charlie Indek was sidelined for the major part of the season, a bad handicap to Coach Keys' five who at this point were on the uphill drive to a victorious season. Indek, a hard driver and ball handler par excellance, is a bright star in this year's basketball dreams.

Other returning lettermen having varsity experience are Ronny Stammel, "Mr. Touchdown," Bill "Moose" McCall, Walt Kendzierski, Bill Scott, Don Grim, Duane Bair, and Bob Fenning. With the team intact from last year and a fine array of freshman prospects, 1956 undoubtedly will reach further heights than its preceding season.

# '69 ers Capture Intramural Crown

WITH the completion of the first successful football intramural season, the 69'ers, a junior class team, bask in the beam of glory after their brilliant victory over the senior team, "De Sousa's Boys." Not only was the season successful for the 69'ers but it stimulated interest in every sports-minded person in the student body. Intramurals can prove to be that bit of necessary relaxation, essential in maintaining a balanced campus schedule. Fellows who have the interest and desire to participate in an athletic program and yet are unable to play varsity ball, find intramurals an excellent outlet for such desires.

Football had a fine turn out with seven teams competing in the league. The biggest contribution came from the freshman class which had three teams in competition: the Sod-Busters captained by Dick Bowman; the Red-Devils;and the Eagles. Ed Cooper's All-Americans and the Wild-ones led by Dick Prins made up the sophomore delegation, while the juniors and seniors contributed one team each: the 69'ers and De Sousa's Boys respectively. Both compiled a five and one log throughout the season. Led by Al Cavalo, the 69'ers roster included Walt Bradford, Merald Sockwell, Pinya Cohen, Bill Bomberger, and Walt Kendzierski. The seniors, who went gloriously down in defeat, boasted of such players as Henry Carpenter, Bill Long, Paul Chubb, George Geils, Al Frost, George Hartfelder, Ben Dillman, Bronc Sander, Eddie Pouttu, and Howie Gordon.

The addition of football brings the number of intramural sports to four; the others being basketball, volleyball, and softball. A team failing to take top honors in one sport can always look forward to the next one.

With the coming of basketball the "Organ Trotters," defending champs, look forward to retaining the honor again this year. Intramural Commissioner, Walt Kendzierski, is looking forward to a larger turnout of teams to comprise the basketball league as well as the volleyball which follows. Softball is strictly on a class-basis, limiting one team to a class.

Intramurals at N.A.C. are still having growing pains, but these minor maladjustments are expected to be ironed out with the growing enthusiasm of the student body.

The '69ers, Champion Intra-mural Football Team, shown here in one of its many practice sessions

# Don't Brush Your Teeth!

## OLD THEORY ON TOOTH DECAY BLASTED BY RESEARCH LAB.

By Frank Wojtowicz '58

MOST PEOPLE woud not think of getting up in the morning and going to school or work without brushing their teeth. This process has become a habit in most of the civilized world today. The dentifrice industry is worth millions of dollars today due to the fact that people realize the great importance that dental hygiene plays in their daily lives. The users of dentifrices generally accept the fact that substances contained within the dentifrice help to prevent tooth decay.

N.A.C.'s own Dr. Albert Schatz, co-discoverer of streptomycin, together with Dr. Joseph J. Martin, research professor, have come up with an astonishing theory on tooth decay that may make the manufacturers of dentifrices a little jittery. According to their theory,dentifrices now in commercial use may help to start and prolong tooth decay instead of helping to prevent it.

The old theory concerning tooth decay states that fermentation acids, formed by bacterial action, attack the outer surface of teeth which is made up of mineral enamel. Experiments have been made to try and verify this acid theory, but to the present there has been little success

Teeth are composed of both mineral and organic matter. Since the mineral aspect of preventing tooth decay had been explored and met with failure, Doctors Schatz and Martin decided to concenrate on the organic angle.

Their research commenced with the facts brought out by observations made by Dr. Charles F. Bodecker, famous professor emeritus of dental histology at Columbia University. Dr. Bodecker made a series of microscopic studies of decayed teeth. Back in 1906 he concluded that it was not the acid acting on tooth minerals that was destroying teeth, rather it was the bacterial destruction of tooth organic matter. The trouble was that dental bacteriologists could not isolate such bacteria and thus prove the theory. Consequently, none of Dr. Bodecker's work held much importance in the scientific field.

This is where Doctors Schatz and Martin have stepped into the limelight. Just recently microbes from the mouth were isolated and found to fit the picture of tooth decay revealed by Dr. Bodecker's experiments. The amazing fact about this discovery is that these newly discovered bacteria are believed to be held in check by lactobacilli and other acid-producing bacteria in the mouth.

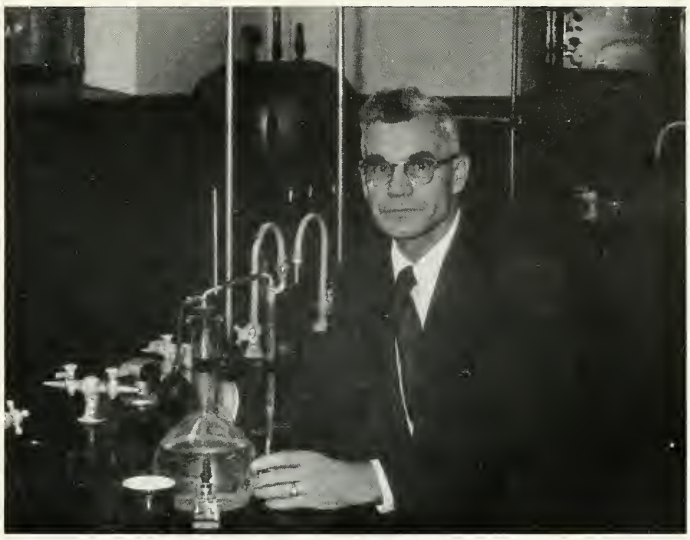
As a result of this new theory, there is a chance that the dentifrices now in commercial use may increase tooth decay instead of preventing it. The dentifrices used today generally neutralize or prevent acid formation in the mouth. The bacteria that Doctors Schatz and Martin believe cause tooth decay appear to be more active under alkaline conditions and to be curtailed by acid conditions. Therefore, it is believed that dentifrices which alkalinize acids in the mouth could do more harm than good.

It could be conceivable that in the future, if the mentioned findings hold enough importance, that the entire manufacturing process of dentifrices would be upset and substituted by another process. This would likely run into the thousands of dollars. To institute this change would mean a complete surrender of present dental theory concerning the origin of tooth decay.

Drs. Schatz (right) and Martin, who have made astounding discoveries in the field of tooth decay

# MAN OF THE MONTH

By George Geils '56



Dr. George E. Turner

BECAUSE THIS ISSUE of the GLEANER is devoted to food industry, it is fitting that our man of the month should be the head of that department in the College. Dr. George Turner has been with the College for the past six years during which time he not only competently managed his own department, but also has contributed to the College Administration to such a degree that he is now chairman of the Faculty and Head of Department of Science and Agriculture.

The "Doc" commands respect on sight and maintains it through speech. Even the students who are compelled to sit quietly through his lectures cannot say exactly how he does it.

But Dr. Turner's accomplishments were not attained effortlessly. He spends as much time preparing for a lecture as he does delivering it, and spends as much time correcting a laboratory report as his students take to perform the task. He starts his day early in order to do all these jobs.

George Ernest Turner, B.S., M.S., Ph.D., was born in London, England. In 1923 he sailed for Canada, which was to be his official residence until 1948, He arrived on the North American continent at the age of sixteen and settled in Winnipeg, Manitoba. Between 1923 and 1932 he farmed in Manitoba. For a while Dr. Turner owned his own dairy farm and then worked on a number of other farms. He left the farm in 1932 to go to college, because he felt that a further education would help him to do a better job and better his understanding of the modern trends in farming.

Upon entering the University of Manitoba, he realized that he had accepted a tough challenge, because he he had to work his way through college. When he was lucky, he tended chickens, but he was usually busy with janitorial work, at twenty-five cents an hour. After he received his degree in 1936, he immediately went to work as the foreman in an ice cream plant where he stayed for two years. In 1938, Dr. Turner was awarded a fellowship to the University of California, where he received a degree of Master of Science in Dairy Industry and Bacteriology.

In 1941, he received an appointment to the staff of the University of Saskatchewan as an instructor in Dairy Manufacturing and Bacteriology. He held this position until 1946, when he again realized the need for further education, and enrolled in Iowa State College to study for his doctorate. His work there was interspersed with teaching duties at the University of Saskatchewan. Finally, in 1948, he was awarded the degree of Doctor of Philosophy for his research work on the Bacteriophage in dairy industry.

After leaving Iowa State, Dr. Turner joined the staff of the South Dakota State College as an associate professor of bacteriology, where he remained until he accepted a position here at N. A. C.

Though he may insist that a student who was absent make up the missing work, he is also willing to spend extra hours with the student giving him the lecture material. It is not uncommon for Dr. Turner to return to school in the evening to help out someone, or a group with laboratory technique, or to give a "boning-up" lecture before an exam.

Not lacking in a sense of humor, Dr. Turner often illustrates important points in the lecture with a witty story. As one of the students expresses it, Dr. Turner has a way of teaching that gets the point across. He expects more, and gets more, from his students.

# TO PROTECT FLAVOR-- BLANCH

**Even with new methods and unbelievable instrumentation much of the work in a modern food plant is done by hand. USDA Extension Service. Photo by George C. Pace.**

By Bill Bomberger '57

PERHAPS the greatest triumph of modern refrigeration is the preservation of vegetables by freezing. Freezing, properly carried out, comes very close to retaining the natural fresh flavor of most vegetables.

This method of preservation is rapidly establishing a foothold in the food industry. Until recently, it was believed that freezing ruined vegetables. For years, freezing of food was discouraged. This was due to the fact that accidental freezing by frost produced a product that became soft and turned black when thawed. Upon cooking, the vegetables tasted bitter and proved unpalatable.

The first laboratory attempts at freezing vegetables were not particularly successful because the products were not blanched. If they were stored at a temperature of —25° F or below, they kept fairly well but at the usual cold storage temperatures, zero or above, the products developed objectionable flavors in about six weeks. Even if the unblanched vegetables had been kept at very low temperatures, when they were allowed to thaw before cooking, off flavors developed. Thus it became evident that freezing alone was not sufficient for sure protection. It was soon learned that an element referred to as an *enzyme* was responsible for the deterioration of the vegetables. This so called *enzyme* action was so pronounced in raw vegetables, as to make their freezing impractical. A method of inactivating this element was soon developed. It consisted of simply precooking the vegetables before freezing. This precooking step is known as blanching in the processing field.

The blanching of vegetables for freezing has been a recognized practice for many years. Methods for testing the efficiency of blanching treatments are also well known. However, examination at random of samples of frozen vegetables by the U. S. Dept. of Agriculture indicates that some of the plants packing vegetables have poor blanching methods. These individuals are not fully aware of the need for complete and adequate treatments or the methods used to determine the efficiency of their blanching methods. There is a possibility that the original blanch may be adequate. The enzyme or enzymes may regenerate during prolonged storage of some vegetables, and off-flavors and odors developed prior to examination of several frozen samples.

Enzymes have been defined as organic catalysts formed by living cells. Catalysts, of course, are substances which alter the speed of a chemical reaction, without themselves being changed. Oxidative and respiratory enzymes are the types of most common concern in vegetables.

In preparing the vegetables for freezing, the blanching operation is aimed at the control of the action of the respective enzymes and enzyme systems found in the original raw vegetable. The main purpose for blanching vegetables prior to freezing is to control by arresting the action of the enzyme systems. If the enzyme systems are not arrested, many undesirable chemical reactions may take place during the storage life of the frozen product. The product may change in color, it may become tough, it may develop musty odors, and there may be a loss of nutritive properties. Obviously, then, the adequacy of blanching or the degree of enzyme activity is related to quality, and the control of quality, during storage of the frozen vegetable.

There are many other reasons for blanching vegetables prior to freezing. Most important is the reduction of the microbial life. Blanching may reduce the bacterial load by more than 90 percent. The wilting of the product to reduce its bulk and facilitate packaging is obvious to those freezers packing spinach and other greens. It is also used to soften the product and to prevent breakage during packaging. Examples here are found with snap beans and asparagus. The fixing or setting of the color of some of the green vegetables is another reason for blanching. Other reasons are the removal of undesirable earthy flavors, soil, dirt, insects, and above all, the removal of occluded air from the tissues of the vegetable.

To date there are two general methods in use for blanching of vegetables

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# WHY A FOOD INDUSTRY MAJOR IN AGRICULTURE

By Dr. George E. Turner
*Professor of Food Industry*

THROUGH the Food Industry of the U. S. many products of the farms reach the consumer in modified forms thus increasing the scope and variety of his diet.

The field of Food Industry in reality includes several separate industries that take fresh meats, fish, shellfish, poultry, milk, vegetables, fruits, flour, edible oils, sugar and starches, and processes them into food products that are essentially different to that of the parent material. As such the Food Industry is a field dedicated to manufacturing and processing in just the same sense as are the textile, steel, and automobile industries. In fact the food processing field ranks the highest of these industries in terms of dollar value of the product.

Furthermore, as an industry it returns to the farmer about two-thirds of the total value of the processed product. Industrially it was the last of the manufacturing industries to be established on a commercial basis, nevertheless, it is considered as "big business" in that it shares equally in importance with these other well-known giants of our industrial age.

The tremendous and phenomenal growth of the non-food industries of the United States, beginning about the middle of the ninteenth century, actually set the stage for the subsequent growth and pace of food industry. Prior to this time, much of the food eaten was home grown while any that needed processing such as butter, cheese and canned foods was a family enterprise. As a result of industrial growth the importance of agriculture became modified. People were leaving agricultural areas and were concentrating in urban areas around industrial centers. As a result of the increased pace of living, less time could be devoted to the preparation of food in the home. Thus there was a definite need for a system for providing food in processed form to take care of the needs of a population that was fast becoming urbanized. This need was supplied by a commercial system of food processing, whereby large amounts of raw food products could be manufactured into many forms with use of industrialized methods and equipment.

As time passed commercial food processing assumed a more important role. With concentration of population came the development of apartment living; with employment of women in industry came the need for further modifications in food processing; with more than one wage-earner in the family income and spending. With these changes, also came desires for greater varieties of foods. The challenge to provide food variety in the diet is evident in terms of the breakfast of today — frozen orange juice, instant coffee, powdered cream, toaster-ready waffles and fresh-fruit frozen jam. Added to this list are table-ready processed meat products, processed cheese, prepared cake mixes, processed baby foods, precooked frozen pies and cakes, complete dinners prepared and frozen at the factory but ready to serve after a few minutes of oven-heating.

No less important and spectacular has been the development of food packaging, whereby food products of all kinds may be bought as distinctive self-service individualized packages in ready-to-serve family sizes. Many food items are sold in prepackaged form. In fact the prepackaged self-service merchandising of foods has contributed largely to the development and success of the modern food supermarket.

The latest advance and one that will probably have a tremendous impact on the technology of food preservation in the near future is the use of radiation to effect sterilization of food. This development promises to open a whole new field of research dealing with changes that take place in flavors of foods subjected to this treatment.

Many of the advances in Food Industry would not have been so far reaching in importance, in so short a time, were it not for the parallel development of laboratory instruments, the tools of the scientist. Just as important, in this connection, has been the development and utilization of electronic instruments to aid in commercial food processing. With this system of instrumentation many operations which formerly required several men, now may be performed by one man working at a central control panel. Such a system is being used successfully in the frozen concentrate citrus juice industry of Florida.

The technological developments that have transferred much of the work of the kitchen to the factory must, of necessity, increase the price of processed food products to the consumer. Prior to First World War the food processor took about 10 cents of each dollar that the consumer spent for food. In recent times this has reached 20 cents.

The chemist, the biologist, the physicist, the engineer and the food technologist are mainly responsible for most of the changes and developments that have molded and shaped the patterns that constititute our modern Food Industry.

These men and women have unlocked the doors to many problems that arise due to the complex nature of food composition. The chemist has learned how to change edible oils into solid fats by a process of hydrogenation and has produced the well-known product we call domestic shortening. The physicist, by using a refractometer may ascertain the extent to which edible fats have been adulterated with non-edible fats. With the aid of the spectrophotometer he may compare very accurately differences that take place in the color of a food product as a result of exposure to varying processing treatments. The biologist confines his studies to those biological agents that bring about changes in food. For instance, he knows that certain types of micro-organisms and enzymes affect food adversely, thereby shortening its storage life. On the other hand, certain processes such as cheese-making and wine-making would be impossible without the assistance of micro-organisms.

The engineer takes over the problem from the chemist, the physicist, and the biologist. His job transfers the results obtained in the laboratory flasks and test tubes to his workshop—the pilot plant. In his capacity the engineer seeks the answer to the question of whether or not a given laboratory process can be profitably launch-

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# TO PROTECT YOUR HEALTH . . .

THE FOOD AND DRUG administration has as its purpose the insurance that foods, drugs and therapeutic devices and cosmetics are pure and wholesome, safe to use, made under sanitary conditions, and truthfully labeled. In essence the administration was established primarily to safeguard the health of the consumer. In order to do this the FDA has approximately 200 inspectors in the field, visiting factories and processing plants and looking for samples of products that may violate the law. Sixteen district offices are equipped with laboratories which analyze the samples. In Washington are the research laboratories which are constantly working on more and different problems and devising new and better methods of analysis. Together the inspectors and chemists get the evidence which is presented to the federal courts for action. Preparation of the cases for the U. S. District Attorney throughout the country is handled by a small legal staff in the General Counsel's office of the Department of Health Education and Welfare. Altogether FDA employs about 900.

Contrasting the size of FDA with the magnitude of its job, it is difficult to comprehend just how all the work is accomplished. The inspections are set up in districts, each inspector being given a specific territory to cover in a definite period of time. This is the routine inspection. Extra inspections may be deemed necessary when consumer-complaints about one particular company mount in the office. The inspectors are trained specifically to note the sanitary conditions in the plant visited and to try to locate the source of contaminants if possible. The inspector may also recommend sanitary procedures to the plant manager, but he has no enforcement authority.

The FDA will bring the issue to court in case of mislabeling or misrepresentation of product, under weight, vitamin deficiency in vitamin enriched foods, deceptive packaging, food contaminants and poisons. Despite the fact that only about 3¢ per capita is spent on the FDA, FDA court actions average 2000 a year. The great majority of these are seizure actions in which the purpose is to take filthy, spoiled, or harmful products off the market. If the goods are in very bad condition the court may order them destroyed. If they can be reconditioned, the court may release them for sorting, cleaning, relabeling and so on, to make them comply with the law. The owner pays for the necessary supervision by FDA inspectors. These funds are deposited in Miscellaneous receipts of the Treasury. In the 1953 fiscal year over 15,300,000 lbs. of unfit contaminated foods were removed from the market; that is over 148 tons per week. Less than two per cent of FDA's cases are contested in court. Of those that go to trial, FDA wins better than 9 out of 10. It is important to note that the FDA is only involved in interstate commerce.

Head Bacteriologist Demonstrates an Instrument for Use in the Field

### Testing Methods

Inspectors should be well grounded in chemistry, bacteriology, and entomology to do an efficient job, despite the fact that they do not give the final decisions on suspected foods. The presence of pesticides in foods is determined by analytical methods using goldfish, guppies or bacteria.

Fresh fruits are tested for spray residues which may be harmful to the consumer. The organic sprays used today make detection difficult.

Insect infestations in plants are fairly common. It is the duty of the inspector to note what types of insects are found in and around the processing plant so that he may give leads to the lab men. Insect fragments may be found in ground up cereals, for instance. Men are trained to differentiate the various insects by their antennae or elytra (wings). When cereal is under inspection for this defect, gasoline is added to a quantity of cereal and is mixed with it. This serves to wet the insect fragments while cereal is not wetted. The insect fragments rise to the interphase from which they are removed for microscopic study. The fragments are

studied under a 30 power microscope for definite identification. A certain amount of insect debris is allowed by law to each quantity of product. Should the number of fragments exceed the maximum, seizure of the product is effected until rectification of the matter, either by regrading or destruction.

Butter is tested for fat percentage. The percentage of fat in butter is stated in each state and no butter beneath the minimum can be sold. Butter is also tested on the basis of its content of water-insoluble acids. Butter made with decomposed cream is high in water insoluble acids.

Vitamin enriched foods are tested to be sure that they contain the stated amounts of vitamin, B12 Nicotintic acid and Niacin.

There are also tests for artifical colors and waxes used on fruit.

The volume of tomato products on the market today is stupendous; catsup, juice, and puree to mention a few. As such these products are under constant scrutiny by the authorities. Not long ago it was not uncommon to find the corn ear worm in tomato products. At present that menace is well under control. Mold seems to be the most common defect today in tomato products. Molds are commonly detected by a Howard mold count in which the product is examined microscopically for evidence of mold filaments. It is quite difficult to differentiate between mold filaments and tomato parts, both appearing the same to the novice.

FDA inspectors report that the size of any particular firm processing food has no correlation to the degree of sanitation practiced in that particular plant.

Testing the food products from a bacteriological standpoint is another important phase of the work of the FDA. The department has four bacteriologists in the field, and ten in Washington doing research work. The men in Washington work out new and better testing procedures to determine the amount of bacterial contamination in a food. When a new method is worked out for a particular food, it is communicated to the men in the field who in turn employ it in their routine testing.

Of particular importance to the tester is the presence of fecal contamination which may readily be shown by plating out a predetermined amount of food to be tested. The nutrient agar plate will be an emphatic demonstration of contamination when it is covered with bacterial contamination. The exact degree of contamination is found out by counting the number of colonies on the plate. Different bacteria will show up as different size, color and shape colonies. While identification of species is for the experienced bacteriologist, the novice can readily distinguish genetic types by virtue of the difference in the above mentioned factors.

The bacteriologist interviewed for this article had formulated 12 simple precepts, which if followed would insure the production of clean product. One of these precepts is as follows: Once an item of food leaves its natural environment it should either be protected from contamination or cleaned. The bacteriologist stated that many people handle food as though it were coal. He states that the proper way for a processor to run his plant is as though the housewife consumer were watching him prepare the food. While the majority of food plants give no trouble they still have to be regulated and must be given standards to comply with. Actually speaking the FDA operates for the fringe element who would not care for his product in a sanitary manner if prosecution were not inevitable.

The reason for this is that the food in its natural environment usually has some means of defence against microbes. An apple for instance, has a fairly tough skin to protect it from microorganic invasions. But if we should slice the apple and leave it in the air, it would be suitable prey for attack for microorganisms. Likewise a bruise on a living animal will heal, but that on a slaughtered animal will become an optimum region for bacterial growth. Theoretically the only unsterile portion of a living animal is in the digestive system. Microoganisms in other parts of the body are called diseases. When a healthy animal is slaughtered it loses all of its protection and defense against microorganisms; in such a condition the meat must be protected by some unnatural means. It is for this reason that we freeze, can, dehydrate and pickle foods. We create unfavorable environments for microörganic growth.

Food processors often are too lenient with their sanitary programs using as the excuse that the food will be cooked before being eaten anyway. As far as the FDA is concerned this idea is erroneous. In most cases the cooking of food will not be for a long enough period to kill the microorganisms. The average housewife will use a prepared food so that she may more speedily get her dinner together. Obviously she will not waste needless time over that which it takes to heat the food to serving temperature, especially since she has been assured over the years that processed food is clean and healthful. Another factor which is also important is that the food may be eaten cold on occasion. It is also interesting to note that even the package directions for preparing the food preliminary to serving do not allow nearly enough time to destroy any microbial organism which may infect the food.

### Labeling

An important part of the FDA program deals with assuring proper labeling of foods. The label is the only contact usually that the housewife has with the packaged product. From that label she must decide whether or not to purchase a particular product for the family. The most obvious type of delinquency in false labeling is that of overstatement of the contents. It is required that the proper weight and volume be stated on packaged goods. Also the ingredients of the product must be listed so that the housewife can get some idea of what she is paying for. For instance two cans of soup with the same contents may either be labeled "Chicken soup with noodles" or "Noodle soup with chicken." The unscrupulous manufacturer would have the public believe that the product is richer than it really is. It is the duty of the department to ascertain whether there is enough of any particular ingredient in a product to have it appear in a prominent spot on the label.

Essentially in reference to mislabeling, the department guards against misstatement of contents, weight or volume, or any other misleading information, inadequate precautionary measures stated in cases of poison, or need for special handling of the product.

The FDA is one of the less popularized branches of the government agencies because a great deal of its work is routine. It is not in effect to punish manufacturers, but rather to prevent mishaps through the use of adulterated or filthy food. The agency does not popularize its arrests, and therefore it would appear to have less romance than FBI or treasury department. But actually the FDA is just as dynamic and important as other departments despite its limited advertising. Most of the people find out about the agency when they have a complaint against some food product and they seek to rectify the matter. But complaints are few since seizure of fil-

*(continued on page 21)*

# The Big Squeeze in Apples

By Howard G. Gordon '56

ALTHOUGH terminology differs in various sections of the country, in general when we speak of apple cider we refer to unfermented apple juice.

The chemical composition of apple juice differs from one pressing to another for a number of reasons. The juice of several varieties of apples is mixed together and the varieties used at the beginning of the season differ from those used at the end of the season. Even if these factors were overcome, the composition would vary because the chemical composition of the juice of a given variety of apples varies, as does the composition of the juices of different varieties of apples. Because of this, our knowledge of fermentation is limited. However, during the past few years some new facts have come to light which have increased our knowledge markedly.

Fresh apple juice contains fungi, bacteria, and yeasts. The yeasts present in the mixture will depend on the microflora in the different juices used, and the yeasts in the mixture will be the sum of the organisms present in each juice used in the mixture.

If the chemical composition of the juices and the micro-organisms varies greatly the fermentations will differ in regard to speed of fermentation and extent of fermentation. Not all of the yeasts present are responsible for fermentation and our knowledge in this respect is still somewhat limited. However, a big step was taken when, in 1919-1950, Barker (in England) investigated six ciders made from kingston Black apples (one of the most valuable cider apples) grown in different districts.

He examined yeasts at the beginning of active fermentation (seven days after the fruit was pressed) and in mature cider. One hundred and eighteen yeast isolates were obtained. The freshly pressed juice had five to eight different kinds of yeasts. Those causing fermentation were described as medium to large cells of ovoid or sausage shape. Their maximum growth limit was about 34°C (93.2°F) and contained numerous spore bearing cells. The yeast fermented glucose, fructose, sucrose, and maltose.

Other yeasts which were possibly of importance in fermentation were lemon shaped cells which developed by terminal budding; common apiculate forms (non-sporing) small to medium in size and yeasts of the Saccharomycedes ludioigii types. It is both surprising and interesting to note the apiculate forms listed because of their reported sensitivity to alcohol.

The yeasts in the mature cider were of the Zygosaccharomyces forms (haploid forms of genus Saccharomyces) and the Lorula forms. Their maximum growth temperature was well over 35°C (95°F), and they fermented glucose, sucrose, fructose, and maltose.

The conclusions drawn from Barker's results are as follows:

1. In any stage the microflora of juices may differ in regard to individual yeasts present, but the predominating yeasts are closely related.
2. Each juice has a well defined type of microflora which is characteristic of the stage of fermentation; this is true of each stage of fermentation.
3. Differences do exist, and the character of the fermentation is individual to the particular fermenting juice.

From these conclusions still other and far more reaching conclusions may be drawn. Namely, that no specific yeast occurs in association with the juice of this particular variety. The fruit itself determines the character associated with the cider and not any specific yeast present in the juice.

It has been definitely established that the nitrogen content of the juice affects fermentation. The nitrogen content varies due to variety of fruit and the cultural conditions under which it is grown. The nitrogen sources for the yeast are the amides and amino acids (especially asparagine). The rate of fermentation is proportional to the nitrogen content on the basis of total nitrogen content and the amount of nitrogen utilized per ten degrees decrease in specific gravity. The nitrogen content also affects the yeast growth. In his work during 1951-52 Burroughs (in England), related yeast growths to the nitrogen and thiamine content showing that a deficiency of these two hurt yeast growth. In 1952 this work gave rise to the speculation that thamine may play an important part in yeast growth and in fermentation.

The apple juice used in these experiments received no special heat treatment prior to fermentation. All of the yeasts involved in this work are wild yeasts which appear naturally in apple juice and are not to be confused with commercial yeasts; namely Saccharomyces cerevisiai.

In reading technical journals you may see yeasts referred to as bottom yeasts or top yeasts. In bottom yeasts the cells remain below the surface of the fermenting liquid during fermentation, forming a sediment on the bottom. Top yeasts form a frothy scum on the surface during the process of active fermentation, and after fermentation has largely stopped, breaks into pieces and settles to the bottom.

# REVOLUTION IN RETAILING

By Gil Finkel, '57

WHEN OPERATING any type of retail business, a few basic ideas must be kept in mind. Primarily, the idea behind most business enterprises is to make money, and every morally acceptable tactic that will accomplish this purpose should be employed. Another important, but not as profitable function of any retail business is to act as a convenient, efficient storehouse for the goods. As a storehouse, the business must display the widest possible variety of goods to the consumer with the least possible expense to the retailer.

Aside from these more obvious functions, a businessman must also assemble goods from various places, sort them out after they become his property, take the risks of spoilage, market change and various other factors, and then last, but certainly not least, he must stake his reputation on the quality of his product.

In the retail food business today, the Supermarket accomplishes all of the above marketing functions in a manner that surpasses every other method of selling. The supermarket came into being with the advent of the nationally advertised packaged food. Since the time of its inception, this type of store has grown to sell not only food products, but also hardware, clothes, toys, flowers, liquor, and even home appliances.

To sell such a large variety of goods under one roof requires a great deal of expert planning, and, just as important, customers. Perhaps the best way to discuss a modern supermarket is to describe one.

### The Parking Lot

The size of a parking lot should be determined by the amount of use it will probably get during the busiest part of the busiest day. A store in a large city will probably require less parking area than will one in a suburban area, or in a small town. The lot should be adjoining the market itself, and should have at least one entrance to the store. There should be ample room for parcel pick-up, and space provided to hold empty carriages. An ideal parking situation is one in which the store is surrounded by more than enough parking without interfering with the unloading operations.

A great deal of emphasis is placed on parking because there is a car for every three people in the United States. By providing plenty of convenient parking space, a supermarket encourages larger average sales, since the shopper hardly has to carry the purchase more than a few feet. To make it still easier for the shopper, many markets have inaugurated a parcel pick-up service, where the packages are loaded into the cars free of charge.

### The Building

The type of building construction seems to vary with the section of the country. High ceilings permit higher stacking of displays without affecting any sort of crowded feeling. The size of most stores is limited only by the amount of money available. The actual selling area should occupy at least 55% of the total area of the building, and there should be ample room in the back of the market to easily handle all of the store packaging functions and utility area. In most supermarkets, especially where the market is near the source of supply, there is little need for large storage facilities. When foods are stored there is always the chance that a fresh product will be received and then sold before the old product is moved out of storage. Cases of food may actually get lost in store-rooms. Air conditioning, while not worth the expense in the back of the store is essential in the selling part.

People have a tendency to buy things because of the way they feel at the moment of sale. This is especially true with food products, since most of the buying decisions are made


Bulbs and footballs, flashlights and dust pans rub shoulders with carrots and potatoes — more and more non-food material is sold in supermarkets


**Full shelves, clearly marked and conveniently located are of utmost importance in the modern food store**

on the spur of the moment. In the summer, when the weather is especially hot, an air conditioned store may attract people who just want to get out of the heat, and who would feel ashamed of walking out of the store without buying anything. In the work areas, the meat and produce are kept cool at all times, and the rest of the area should have at least a fan.

Incandescent lights are preferred by many store owners because they give the various foods the color that a shopper expects to see. Fluorescent lighting is more natural, but most people aren't prepared to see the food they are buying under natural conditions. The incandescent light also tends toward accenting highlights on produce, while the fluorescent light, with its longer light source, tends to minimize highlights and shadows.

The floors should be durable, easy to clean, attractive, and light in color. The light color is important because the floor acts as a reflector for the ceiling lights, and cuts down the lighting expense.

Receiving facilities vary from store to store to some extent, but may be classified as either "Platform" or "Door" type. The terms are self explanatory. Where space is available the platform type is preferred since it avoids congestion in the interior work areas. The advantage of the door type of unloading station is that the area can be used for interior work area when unloading is completed, while the platform is just so much wasted space after the truck leaves. Most shops mark the individual items as they are being placed on the display counters, but some chains mark each item as it comes from the truck. The latter facilitate stocking the shelves during rush hours.

### The Fixtures

The fixtures involve not only the display cases (gondolas) and frozen food cases, but also temporary displays at the end of each row of gondolas, cash registers, automatic door openers, and various other minor items.

Merchandise on a shelf must be attractive and clean. It must be within easy reach and clearly priced. The cases must accomplish all of this, and hold enough food to supply the peak hours without too much attention.

### The Layout

Items that require longer decisions prior to sale should be placed on the periphery of the store, where the aisles are widest, and congestion is minimal. Service items, such as fish sales, should be placed in the rear of the store, away from the check-out to minimize congestion in an already crowded area. Related foods should be found near each other to minimize wandering. The food should be easy to find, for if it isn't few people will look for it. Cash check-out should be located very near the exit, and should have enough room to handle rush-

**High Quality merchandise is of untold importance in any business—here, the produce is made ready for over-night storage**

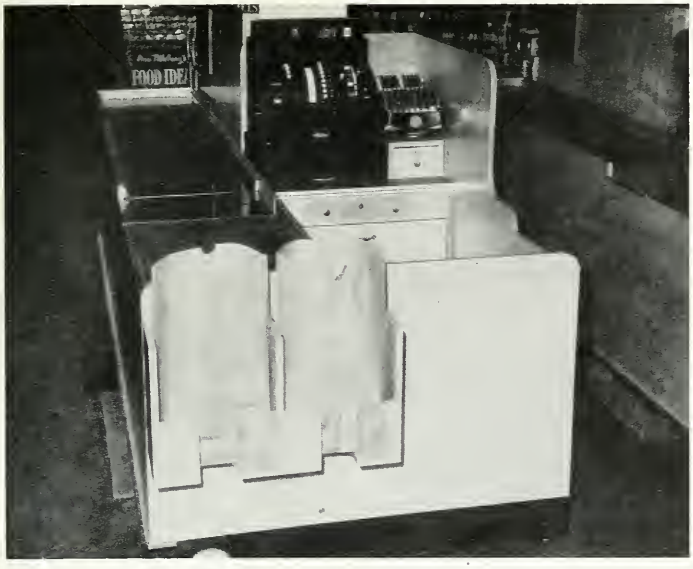
hour crowds. Customer unloading, moving counters, wrappers, and a large amount of checkers and cash registers are used to great advantage in speeding check-out. Specialties, such as flowers, should be located near the front of the store, where they will attract more people. Colorful produce is located further into the store, with the idea of bringing the people further in. Pastry is located near the checkout on the theory that people think of dessert last, or just before leaving.

Office space may be located on a second floor balcony to prevent loss of floor space, and to keep a closer check on pilferage, which may amount to as high as 1% of total business, almost as much as the profit.

### The Display

It is well to remember that in a supermarket, there are little or no salesmen—the food must sell itself. This is accomplished in two ways: by its general appearance, and by its brand name. For this reason, the great majority of merchandise sold is nationally advertised and well known. The product must be sold before the customer comes into the store. However, even when the food is presold, it must look good on the shelf before the sale can be made. Counters must be full, and they should, with most foods, be rather neat. Large displays, such as pyramids, may be actually deleterious because customers are afraid of either ruining the display, or of being the first to buy something. Imperfect, but neat displays aid sales. There should be a contrast of colors on the shelves — there is enough monotony in the packages without adding to it by stacking similar colors next to each other.

**Roll-a-Back shelves, a new idea in baby food display, cuts down breakage, attracts customer attention, facilitates storage and insures fresh merchandise**



**The "Redi-Chek" Check-out Counter. USDA photo.**

Displays at the end of a gondola break up the monotony of similar layout. While it's bad to change the general location of products, changing these minor displays is almost essential.

In the modern supermarket there can be no competition between products as there may have been in the days of the corner store. Too many products are sold (5000 in the grocery department alone) to allow any competition.

Competition between supermarkets, however, is keen. This type of store was brought about by a revolution in packaging, and in this revolution, as in any other, there are people who were hurt. The supermarket is the store of the future—the general store, with other diversified businesses, has passed out of the picture.

# NOTES and NEWS

## – IN AGRICULTURE –

SCIENTISTS of the United States Department of Agriculture believe that any doubt that embryo turkeys can develop from unfertilized turkey eggs has been dispelled in a series of experiments by the Agricultural Research Service. The tests were conducted, with extreme care to avoid any chance of error, by M. W. Olsen and S. J. Marsden, and demonstrated that the phenomenon known as parthenogenesis—embryonic development in unfertilized eggs – does exist in turkeys.

The discovery of parthenogenesis in turkey eggs was first made in the course of studies at United States Department of Agriculture's Beltsville Research Center on the effect of artificial light on fertility of turkey males. Because of its fundamental importance to our knowledge of life processes, a careful recheck of this unusual phenomenon has been made.

The tests were conducted with seventy-nine Beltsville Small White female turkeys. These were segregated from their immature male pen mates before they were six weeks old. In the period until and after egg laying began, these turkey hens were kept in pens remote from other turkeys. The 79 hens laid 2,537 eggs during the eight weeks of the experiments, and all eggs were carefully marked at the time they were gathered.

Earlier experiments had shown that parthenogenic development cannot be seen with a candler before about the fourth day of incubation, compared with 18 to 24 hours in most fertile eggs. So eggs from the experimental hens were candled for the first time on the ninth day of incubation. Eggs showing signs of development were returned to the incubator. Others were removed, broken out, and examined for evidence of development.

Out of 2,537 eggs incubated from the experimental turkeys, 568 or 22.4 percent showed parthenogenic development. In 27 of these, embryos and blood vessels were found. Three of the embryos reached a stage of development equivalent to that of 26 to 27 days in normal eggs. With one exception, embryos that developed to or beyond the equivalent of a normal 9-day embryo appeared to be perfectly formed. In the remaining eggs, parthenogenic development was limited to extra-embryonic membranes in 492 and to readily discernible blood islands or vessels in 49.

The 22.4 percent incidence of parthenogenesis in the 1954 tests compared with 16.7 percent in 1952 experiments and 14.1 percent in 1953. This increase is believed to be the result of selection of Beltsville Small White females with a strongly developed trait for producing such eggs for use in the 1954 test. The results from the two earlier experiments are believed to be closer to the average incidence of parthenogenesis in normal flocks of Beltsville Small White turkeys. The phenomenon also has been observed in eggs from hens of the Broad Breasted Bronze and Light Palms breeds, running 11.5 percent in both cases.

Of considerable importance to turkey breeders and growers are the observations that very few of the females in the 1954 tests failed to produce some parthenogenic eggs, some produced only a few, and more than 20 percent of the eggs laid by a considerable number of the hens were of this type. These findings strengthen the scientist's belief that production of parthenogenic eggs is an inherited trait that probably can be controlled by selection.


This perfectly formed parthenogenic turkey embryo missed hatching by 2 days. It lived 30 days – 2 more than the normal incubation period of fertile eggs – and showed development equivalent to a normal embryo at 26 days. USDA photo.

### Natural Enemy of Citrus Pests Likely to Benefit Florida Growers

*Brumus suturalis*, a beneficial lady

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# NOTES and NEWS

## – ON CAMPUS –

By Al Cavallo '57 and
Alan Oliver '59

MR. JAMES POPHAM, a new professor at N.A.C., has his work cut out for him in the chemistry department. Born in the Dominion of Canada, he attended McGill University in Montreal, graduating with a Bachelor of Science Degree in chemistry. A Masters Degree in Psychology was next added to his scholastic record. Completing his education here in the states, Mr. Popham attended Princeton University where he received a Masters Degree in chemistry.

No novice in the practical end of teaching, he has taught at Indiana University and the University of Michigan. He thinks one of the biggest advantages of a small college is the chance to get better acquainted with the students as individuals. This leads to better instruction and less formality in the class room.

Mr. Walter Lamont is also new to the National Agricultural College. He took over the direction of the Glee Club. Graduated from West Chester State Teachers College in May 1951 he has a Bachelor of Science Degree in Music Education. He was a member of the college a cappella choir and sang for four years with the male glee club. While serving in the Army for two years, Mr. Lamont was active in organizing and directing many Infantry Choruses and Chapel Choirs.

Mr. Lamont has taught vocal music at Southampton Senior High School, and is presently teaching in the Woodrow Wilson Junior High School in Philadelphia.

Under Mr. Lamont's guidance, we feel the glee club will continue to improve upon their present reputation.

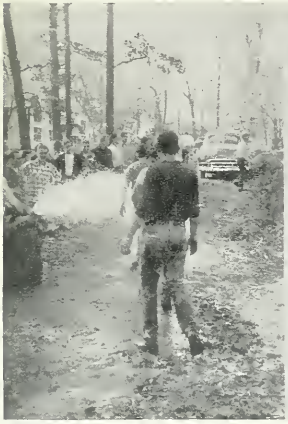
Congratulations to Mr. and Mrs. John Guisti on the arrival of their 8 pound 13 ounce baby girl "Mandy." John is a graduate of N.A.C., and left a football record here that will never be forgotten. The baby was born October 10, 1955 and makes number two for the Guisti family.

N.A.C. football coach, Mr. Charles Keys, Jr., was co-guest speaker at the Brooks-Ervine annual football banquet held at Kenny's Restaurant in Camden, N. J. Mr. Keys spoke about N.A.C., and naturally football. Also honored was Willis "Skip" Thompson, Aggie Captain, who was chosen outstanding back in the South Jersey area.

After a thirteen-minute no-give no-take battle, the sophomores finally pulled the freshmen through the mud to add an extra week of frosh hazing.

Although the freshmen went down in defeat, they were the first class ever to have any planned strategy to back up their brawn. Following the rope pull, the event was ended with Barry Price, frosh president, carrying Dick Dennis, sophomore president, across muddy "Lake Archer," and the entire freshman class class being soaked with the fire hose.

Just as it was once tradition that freshmen win the annual rope pull, the tables have been turned as the sophomores have been victorious for the past three years. Congratulations Sophs!



**The Annual Tug-O-War was a good clean battle, as any doused Freshman can verify**

Close up of muskrat house. Muskrats may provide as much as 25% of farm income. USDA photo.

# FARM FUR CROPS

By Ben Snavely '59

THE muskrat is found in all parts of the United States and is the most valuable of all the wild fur animals. The increasing use of this type of fur for capes, women's coats, and boot linings will keep the demand for these pelts riding high. Although the muskrats do a great deal of damage in some areas of the country, they live on swampland unsuitable for agriculture. They are very prolific; this helps in keeping them from becoming extinct through extensive trapping.

The annual harvest of muskrats amounts to more than 20,000,000 pelts. The price paid varies from four dollars apiece in the northern states, to fifty cents in the southern states. Last year I received a dollar sixty-five, which is about average for the Pennsylvania grade of fur. For this price, the muskrat must be skinned, the hide stretched, and then properly cured. This takes a little more effort on the part of the individual, but the difference in price is well worth the labor.

During the summer months, the muskrat needs little protection, living in almost any kind of grass and mud shelter. In the fall when the weather becomes colder, they become very active. They add to and reinforce their summer houses, increase their storage of food, and dig their canals deeper, so that they won't freeze later on.

The muskrat house is usually constructed of grass, roots, sticks, and mud, and located on a swamp or shallow pond. It is dome shaped and usually about two feet in height. The walls may measure four inches in thickness and are lined on the inside with mud and tender grass shoots. This lining helps keep the nest warm in winter and cool in summer. There are between two and four underwater tunnels leading to the nest, which leaves open an entrance to the muskrats, but not the winter air.

Since the muskrats spend most of their life in their underground tunnels and burrows, they depend largely on concealment for protection. Most of their work, therefore, such as digging roots, and gathering grass, is done at night when they can't be seen.

Frequently muskrats are found living along the edge of a woods, stream banks, or drainage ditches. Instead of building a house, they burrow into the stream banks, with the entrance to the burrow usually underwater. In these burrows there may be two or more rooms, some of which are used for food storage and others for nests. Some of the larger burrows have well-hidden surface openings which are used for air-vents, and also serve as an escape exit.

The muskrat's diet varies with the season and the plants available. During the summer their food consists mainly of roots, leaves, and various other water plants. In the winter, when plants are scarce, and ponds and streams frozen over, the muskrat lives mostly on underground parts of plants. They store some roots, but depend mostly on their ability to dive and obtain submerged plants and stems of aquatic plants.

Mating begins during the latter part of March. The first litters are usually born during the first week of May and consist of six to eight young. The young muskrats weigh less than one ounce at birth and are completely helpless. They develop rapidly, and by the time they are five weeks old they are capable of finding their own food and taking care of themselves.

To begin trapping, a supply of steel traps and steel name-plates is required. There are several types of traps, but the most popular for muskrats is the No. 1 jump trap. These traps are manufactured at Lititz, Pa., by the Animal Trap Company of America and sell for about four dollars and seventy-five cents a dozen. The traps will rust and therefore if not properly treated and stored they will only last a few years. At the end of the trapping season the excess dirt should be scraped off, and the traps dipped in old crankcase oil. This will help to keep them from rusting when not in use.

The different methods of setting the traps depend on existing conditions in various parts of the country. An experienced trapper looks for certain signs of muskrat activity when deciding where to set his traps. These signs may take the form of muskrat tracks in fresh mud, narrow channels through the marsh, new houses and old ones with fresh repairs, etc.

A knowledge of muskrat behavior helps the trapper a good deal. The muskrat does most of his feeding at night, although on a damp, foggy night there will be much more activity

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# HONOR AGGIES

By Robert Pletz '58

EARLY THIS MONTH, Howard Gordon, an outstanding Senior from Bronx, New York, was interviewed to share Aggie Honors.

A graduate of the William Howard Taft High School in the Bronx, Howard is a food industry major. He feels that he is fortunate in having the privilege of studying under Dr. Turner and his staff.

"Howie" has been active in extra curricular affairs throughout his college career. As a freshman, he played baseball for N. A. C. He became a member of the Varsity Club, serving as its treasurer during his junior year. He is an active member of the Food Industry Club. Having been associated with the GLEANER Howard is well qualified to assume responsibility as co-editor of the 1956 "Cornucopia." Last, but not least, Howard has been elected secretary of the Senior Class.

Every summer, to fulfill the requirements of the summer practicum, Howard has worked in the Pepperridge Farm Bakery in Connecticut.

He feels that he would like to attend graduate school and eventually act as a consultant to the Dairy Industry.

Howard is a valuable asset to the student body of the National Agricultural College. We are sure he will be a valuable asset to the community in which he establishes himself after graduation.

JOE BUCHELL comes to us from Rutherford, New Jersey. Before entering College, Joe served 4 years with the U. S. Army, 3½ of them in Germany with the Army Engineers. While in Germany, he attended a utility engineers school for Non-Commissioned Officers and graduated as an honor student. Joe was discharged with the rating of Sergeant.

As a dairy husbandry Major, Joe has been very active in the Animal Husbandry and Dairy Clubs, serving as president of the latter for 2 years. During his sophomore year he was elected to the vice-presidency of his class, and this year was honored by being elected Senior Class President.

During the past 3 years, Joe has been active in intramural sports and was also a member of our football squad for 2 years. Among his other athletic accomplishments, Joe is an expert in the art of Judo. He has taught some of the students, and in past years has given exhibitions for the college on "All Sports Night."

Known as the organizer in his class, he is the inspiration that pulled his class to victory for two consecutive years in the annual rope pull.

Joe was fortunate last summer in working on the famous Pabst Dairy Herd in Wisconsin. He helped groom the show herd of Holsteins for the Milwaukee and Minnesota State Fairs.

In the future, this Aggie intends to specialize in organization and maintenance of Dairies. We at N. A. C. know he'll be successful.

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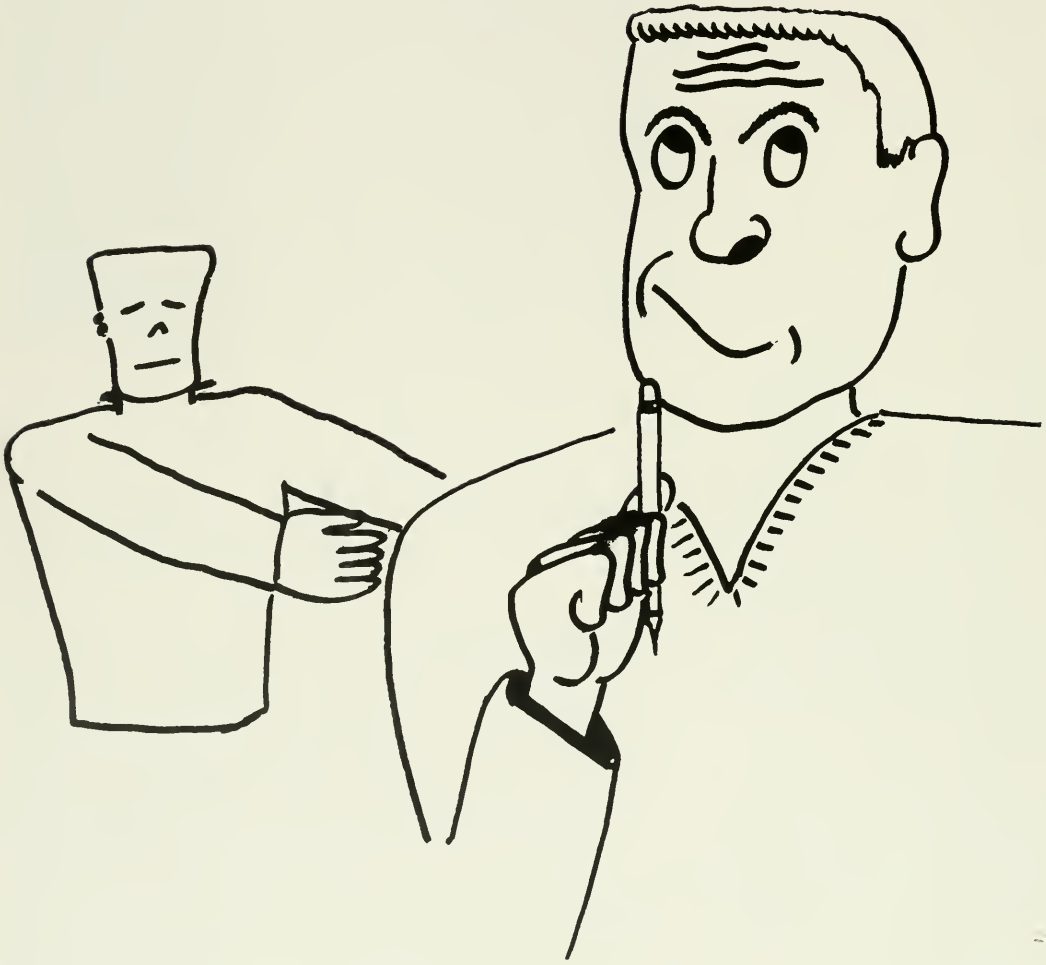
### TO PROTECT YOUR HEALTH

*(continued from page 12)*

thy food is usually made before it can get to the hands of the public. The work of the administration is made very difficult by the fact that a new manufacturer does not have to register with the agency when he decides to put his product on the market. It is up to the FDA men to find the new product and inspect the plant unaided.

# RATE YOUR ROOMIE



1. If your Roomie gets a higher mark on an exam than you do, do you accuse him—
   a. of having a better pony?
   b. of stealing the exam and not telling you?
   c. of not having copied from you?
   d. of studying?

2. If your Roomie gets a "Dear John" letter, do you—
   a. say "I told you so"?
   b. say she wasn't worth it?
   c. let him date your girl?
   d. ask for her address?

3. When your Roomie goes to sleep before 11 o'clock, do you—
   a. sneak out your food?
   b. sit and pout?
   c. sneak out his food?
   d. type anyway?

4. When your Roomie loses your laundry ticket, do you—
   a. curse him for wearing a different size?
   b. accuse him of losing your wallet?
   c. walk around naked?
   d. go pick it up yourself?

5. If your Roomie sweeps the room, do you—
   a. say "I was gonna do it"?
   b. call the asylum?
   c. open the door so he can sweep it out into the hall?
   d. tell him no girls allowed in the dorm?

6. When your Roomie borrows your last pair of khakis, do you—
   a. wear the dirty ones?
   b. wear an extra long shirt?
   c. sell his khakis?
   d. tell him to return them to the person you borrowed them from?

7. When your Roomie leers at you, do you—
   a. tell him to wait for "chow"?
   b. tell him you're sorry?
   c. give him a girl's address?
   d. give him a boy's address?

8. When your Roomie has a test and you don't, do you give him—
   a. sympathy?
   b. your "No-Doz"?
   c. old ponies?
   d. Prayer Book?

9. When your Roomie insists on getting up for breakfast, do you—
   a. break his alarm?
   b. tell him what they're serving?
   c. cuss under your breath?
   d. get out the Bicarb?

10. When your Roomie polishes his shoes, do you—
   a. tell him the polish smells up the room?
   b. ask him to polish yours, too?
   c. ask him who the girl is?
   d. tell him it's muddy on Feather-Bed Hill?

If you answer more than five a's you're miserable, move out.

If you answer more than five b's you're incompatible, tell him to move out.

If you answer more than five c's you make a wonderful couple.

If you answer more than five d's make it legal and get married.

## WHY A FOOD INDUSTRY MAJOR?

*(continued from page 11)*

ed on a factory scale. The step from the pilot plant to full scale factory operation is undertaken by the technologist. He works out the additional details to finalize the work initiated in the laboratory. This will include: consumer acceptance of the product based on flavor, palatability, nutritive quality, the sanitary quality of the product or ingredients used and the maintenance of quality during manufacture. Obviously, in order to have success in such projects teamwork between these experts is of necessity, a primary requisite.

Briefly, the aim and purpose of the Food Industry is to train those interested in a Food Industry career in the methods and techniques of the scientific approach to the field of food processing. The basic sciences acquired during the first two years of college are applied and expanded during the succeeding two years. Seniors and juniors in Food Industry know that "knowledge is power" but that knowledge together with ability to put that knowedge into practice means "knowledge successfully applied." The field of Food Industry presents a challenge to the food scientist, while the student with scientific training becomes better equipped to accept this challenge when occasion arises.

Those who decide to make a career of Food Industry will find it a dynamic, enthusiastic, and profitable profession. Problems will ever confront the food industries; new ones as well as recurring old ones. A broad understanding of the scientific background and technological advances of several different phases of the processing industry forms a useful foundation for special problems in specific fields of food processing. Important too, is an intimate knowledge of several sciences coupled with the ability to integrate them to any problem at hand.

Mere recognition of the scientific viewpoint, in itself does not make a scientist. The true scientist uses science as a tool, a means to an end—that end, to leave a torch that will light the way for those in the future, who also seek the truth through science.

The logical starting point for the Food Industry major is that he become familiar with all phases of agriculture and that he understand how science works in each phase of agriculture. Where else than at the National Agricultural College may he acquire "Science with Practice."

## BIG TIME COLLEGE ATHLETICS

*(continued from page 5)*

could be realized far better if athletics were promoted as recreation and physical education. It is also true that many fine athletes make outstanding scholastic records which might imply that there is no conflict between education and athletics. Big-time athletics requires 20 to 28 hours per week of an athlete's time. It is therefore bound to detract from an athlete's education.

College athletics is public entertainment. For example in recent years football audiences have numbered over 40,000,000 each year. It has been estimated that the public pays $100,000,000 a year to colleges for admission tickets. The publicity that a team receives is far greater than the publicity that a college president receives upon his appointment. The American public can easily name more college coaches than college presidents.

Many large institutions are organized into athletic boards and are managed by highly paid commissioners. Scheduling is treated with all the consideration that might be accorded an important financial deal. Frequently athletic directors are caught in the squeeze of high costs and inadequate gate receipts. Concessions and scholarship supported bands all contribute to public entertainment but do not serve any educational purpose.

Athletic spectacles such as the Bowl Games have become immensely successful business promotions with total Bowl receipts as high as 2.5 million. A participating institution may receive as much as $125,000. The athletes who are considered amateurs frequently are rewarded with expensive gifts and secretly may be rewarded with cash. Certainly there is no educational significance in such enterprises.

One of the most shameful practices of big-time college athletics is the bidding for outstanding players. The pressure frequently is very great on a player and he often ends up as a political puppet of the institution involved.

Big time college athletics has entered the class of show business. With this type of program a great deal of stress and strain is evident upon the educational institution. Recruiting seems to have become legal. The present big-time system calls for a fundamental revision of athletic concepts and policies. Only then may it once again become an educational and justifiable activity.

# HIJACKED HUMOR

Compiled by John Lesko '57

The little moron's watch had stopped and he tried to find the trouble. Finally, he took the back off, went into the works, and found a dead bed bug.

"No wonder it doesn't work," he said. "The engineer's dead."

★ ★ ★

Two drunks were sitting in a bar thinking of things to do to pass the time away.

"Let's play television," said one.

"O.K." said the other. "How?"

"I'll make believe I'm a great big T.V. star, and you guess who I am."

"Shoot."

"All right," said the first, "I'm 5' 4", have blonde hair, blue eyes, 38-24-36, and I'm beautiful."

The second drunk stared at him for a moment and said, "Never mind who you are, kiss me!"

★ ★ ★

When girls are little, they are all like dolls; when boys are little, they are like soldiers. When they grow up, the girls want the soldiers and the boys want dolls.

★ ★ ★

A man was sitting in a padded cell shouting at the top of his lungs, "I am Napoleon. Let me out of here."

The keeper came over to him and said, "How do you know that you're Napoleon?"

"God told me," was the reply.

A little man sitting next to him looked up and said, "I did not!"

★ ★ ★

Two morons had remarkably good luck fishing. Toward the end of the day one of them said, "This is a good spot. I wish we had some way of finding it tomorrow."

"Why don't you put a mark on the boat?" said the other.

"That sounds reasonable," said the first, "but how do you know that we'll get the same boat?"

★ ★ ★

"Just when do you intend to drive back to town and take me home?"

"As soon as you say the word."

"Then let's go home."

"That's not the word."

She: "How did you like the bridge party last night?"

He: "It was fine until the cops looked under the bridge."

★ ★ ★

A small girl was studying a fashion magazine.

"Mummy," she said, "Why do they always make pictures of ladies who are not quite ready?"

★ ★ ★

Newlyweds on honeymoon in wire to boss—"Please extend vacation. It's wonderful here."

His boss replied: "It's wonderful anywhere. Get back to the office."

★ ★ ★

When a motorist who had crashed into a telephone pole and had torn down the wires recovered, his hands were tightly clutching the wires.

He opened one eye and peered at them. "Thank goodness," he exclaimed. "It's a Harp."

★ ★ ★

Hank, with a terrific hangover, went out to the barn at 5 a.m. to start milking and a long day of chores. Said the first cow:

"Brother, you look terrible, the circles under your eyes hang down to your knees."

"Yeah, I know it, and I gotta work at these durn chores 'til 7 o'clock tonight."

"Well, I'll do all I can to help," volunteered the cow. "You just hang on tight and I'll jump up and down."

★ ★ ★

Prof.: "The examination papers are now in the hands of the printer. You have three days in which to review the term's work. Are there any questions?"

Voice from the rear: "Who's the printer?"

★ ★ ★

"You should be more careful to pull your shades at night; I saw you kiss your wife last night."

"Ha-ha-ha, the joke's on you; I wasn't home last night."

★ ★ ★

"How did you break your leg?"

"I threw a cigarette into a manhole and stepped on it."

Letter to freshman parent:

Dear Pop:

Everything is fine at school. I'm getting lots of sleep and am studying hard. Incidentally, I'm enclosing my fraternity bill.

Your son,

John

Letter to son:

Dear John:

Don't buy any more fraternities.

Pop

★ ★ ★

Scotchman: "Hurrah for Scotland."

Irishman: "Hurrah hell."

Scotchman: "That's right, every man for his own country."

★ ★ ★

Customer: "Have you a book called 'Man, the Master of Women'?"

Salesgirl: "The fiction department is on the other side, sir."

★ ★ ★

Neighbor: "What did your son learn at N.A.C.?"

Proud Parent: "Well, he hadn't been home a week before he showed me how to open bottles with a half dollar."

★ ★ ★

"Melvin, Melvin—!"

"What, Ma?"

"Are you spitting in the fish bowl?"

"No, Ma, but I'm coming pretty close."

★ ★ ★

A tall Texan entered a saloon with his wife and three-year-old son. He ordered two straight whiskies.

"Hey Paw," yelled the kid," "ain't Maw drinkin'?"

★ ★ ★

And now to the serious side of living—Patriotism.

I'm glad that I'm American
And proud that I am free;
But I wish I were a little pup,
And Russia were a tree.

★ ★ ★

A gunman walked up to the cashier of a movie theatre, stuck a gun in her face and growled, "The picture was lousy—give me everybody's money back!"

## FARM FUR CROP

*(continued from page 20)*

than on a bright, moonlit night. Occasionally when a muskrat gets caught in a trap, early in the night, it will try to chew its leg off; however if the trapline is checked every morning before daylight this rarely happens.

If a trapper wants to get the most return from his trapline he will skin the muskrats as soon as possible after catching them. The skinning is easier when the body is still warm; and both skin and carcass keep better if handled at once. Peeling the pelt from the carcass requires careful cutting and pulling, which can be done quickly after a litte practice.

There are several different methods used in the actual skinning of the muskrat, this depending entirely on the preference of the trapper. The method that I use is sometimes called the underhand method. I pinch the tail under the heel of my boot, cut a slit from the one hind leg to the tail and over to the other hind leg, then the skin is pulled up over the head, taking care not to cut up the carcass.

After the daily catch has been skinned, the pelts should be stretched immediately so that the skin does not shrink. Care should be taken so that all mud and blood is brushed out of the fur, so that it doesn't dry thin and straggly. The skin can be stretched either on a commercial wire stretcher or on a homemade shingle board, with about equal results.

Although the muskrat is trapped primarily for its pelt, its meat is highly prized in the southern states. It is also served in many of the leading hotels and restaurants of the larger cities, where it is served under the name of "marsh rabbit."

# VARSITY BASKETBALL SCHEDULE

| | | | |
|---|---|---|---|
| Dec. | 5 | New Brunswick Seminary | Home 8:00 P.M. |
| Dec. | 7 | Ursinus College | Home 8:00 P.M. |
| Dec. | 8 | Philadelphia College of Pharmacy | Home 8:00 P.M. |
| Dec. | 15 | Temple College of Pharmacy | Away 8:00 P.M. |
| Dec. | 16 | Newark State Teachers College | Home 8:00 P.M. |
| Jan. | 4 | Haverford College | Away 8:00 P.M. |
| Jan. | 13 | Kutztown State Teachers College | Away 8:00 P.M. |
| Jan. | 17 | Cheyney State Teachers College | Home 8:00 P.M. |
| Jan. | 20 | Newark State Teachers College | Away 8:00 P.M. |
| Jan. | 26 | Susquehanna University | Home 8:00 P.M. |
| Feb. | 3 | Jersey City State Teachers College | Home 8:00 P.M. |
| Feb. | 6 | New Brunswick Seminary | Away 8:00 P.M. |
| Feb. | 8 | Kutztown State Teachers College | Home 8:00 P.M. |
| Feb. | 14 | Philadephia Textile Institute | Away 8:00 P.M. |
| Feb. | 16 | Temple College of Pharmacy | Home 8:00 P.M. |
| Feb. | 21 | Cheyney State Teachers College | Away 8:00 P.M. |
| Feb. | 24 | Philadelphia College of Pharmacy | Home 8:00 P.M. |
| Feb. | 28 | Jersey City State Teachers College | Away 8:00 P.M. |
| Mar. | 1 | Philadelphia Textile Institute | Home 8:00 P.M. |

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## NOTES AND NEWS IN AGRICULTURE

*(continued from page 18)*

beetle imported about a year ago from Pakistan, may aid native lady beetles in controlling certain Florida citrus and vegetable pests. *Brumus* feeds on many Florida insect pests, including aphids, psyllids, whiteflies, mites, some scale insects, and mealybugs. So far, nineteen releases of *Brumus* have been made in Florida. Groves on a no-spray program were chosen to give this predator the best possible chance to become established. Temple oranges and tangerines were selected when possible, as they put out flushes of new growth more readily and furnish a better supply of aphids than other varieties. The first successful introduction of one insect to destroy another took place many years ago in California, where the cottony cushion scale threatened the existence of the State's citrus industry. The most important insect enemy of this citrus pest was found and shipped to California. Eighteen months later, the California orchards were practically cleared of the cottony cushion scale.

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## TO PROTECT – BLANCH

*(continued from page 10)*

prior to freezing. One of them is immersion of the vegetable in hot water. The other method is exposure of the vegetable to live steam usually at atmospheric conditions. Water blanching offers certain advantages in that the temperature can be controlled over a wider range. This is reported to be important for certain vegetables.

There are, however, certain disadvantages to water blanching. If the water is excessively hard, that is, water containing calcium or magnesium salts, the particular vegetable may become tough after the blanching operation. Water also bleaches or dissolves out more of the water-soluble food materials than steam blanching. This may cause a lack of flavor and loss of soluble nutrients in the finished product. Steam blanching, on the other hand, is usually easier to accomplish although a slightly longer time may be required to inactivate the enzymes.

Water has one big advantage over steam in that its buoyancy helps to separate the individual units of vegetables from one another and thus subject all surfaces simultaneously to the temperature of the blanching medium.

Blanching times are very important regardless of the medium (water or steam) used. The times vary for the different vegetables. Further, they vary according to the maturities and the size of units for any given vegetable. Tests for the adequacy of blanching have been worked out and in general can be classified into two general groups based on the type of enzyme system present in the vegetable. The Catalase Test is the simpler test to use and has been reported to be a good test to determine the adequacy of blanching for most vegetables. The peroxidase test for enzyme activity is quite simple. The peroxidase enzyme system is more heat resistant and usually takes a longer time to inactivate than the catalase enzyme. The necessity of inactivating the vegetables to give a negative peroxidase test depends on the vegetable.

Obviously, overblanching of all vegetables would make certain that the enzyme system was completely inactivated if these tests were used to determine enzyme inactivation. This is not desired since overblanched products in most cases do not store as well nor will they have all the desired quality characteristics of high quality frozen vegetables. Thus, after blanching, it becomes necessary to cool the vegetable properly and promptly. Many methods of cooling have been described. Perhaps the most common is to immerse the vegetable in cold water. Other methods are to use cold air, or to convey the vegetable immediately through the freezer tunnel. Regardless of the method employed, timing is important. It is important first of all because the vegetable should be cooled immediately to prevent overheating or overblanching. Secondly it should be timed long enough to lower the temperature below 70-80°F. Naturally with lower temperature cooling quality retention is considerably better provided all other conditions are within control.

Who can tell how rapidly the industry will grow and how far it wil spread? Once the retail trade in frozen vegetables is established throughout the large cities in the country so that national advertising will be profitable, it will grow very rapidly. This will make it possible for the larger producers to break down the general prejudice against frozen foods.

As the demand for frozen vegetables grows, processes of freezing many other vegetables will be worked out. At the present it is estimated that 75 percent of American families own deep freezers or refrigerators with compartments where frozen foods may be stored. This itself is proof that the frozen food industry is establishing a foothold in the vast food field.

## POET'S CORNER

By Sven Kastor '57

I bury my troubles deep in the ground
Where only God can hear the sound.
I look over the hill and hear the
rooster call;
And feel the spirit that is within
us all.
I see a view of grass, so luscious green
My eyes hardly believe what I
have seen.
I feel that the birds, trees are
awakened with joy;
And wonder how a man can stop
from being a boy.
I listen for the cricket's noise,
And watch for the early morning
butterflies, I see them flap their
wings, and creep upwards towards
the sky.
I see the sun passing through the
portholes of the trees;
And know that man shall someday
be free.
I watch for the pure red in the
rising sun;
And think that our real liberty
has just begun.
I feel that nature is God's
interpretation to man;
I search for the understanding of
God's guiding hand.